Cell Biology

MYOFIBROBLAST DIFFERENTIATION, MATRIX PRODUCTION, AND COLLAGEN RECEPTORS IN MK/T-1 CELLS PLATED ON TYPE I COLLAGEN, TYPE VI COLLAGEN, AND GLASS

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When injured, the fibroblasts of the corneal stroma differentiate to myfibroblasts. Normal corneal fibroblasts produce a specific matrix composed of special types and amounts of collagens and special proteoglycans. This matrix is clear. The differentiated myofibroblasts do not produce the appropriate corneal specific matrix and the cornea is no longer clear at the injury. Previous studies showed that corneal fibroblasts plated on Type VI collagen spread more than those on Type I collagen. Unpublished data indicated that when corneal fibroblasts were plated on Type VI collagen, they exhibit myofibroblast markers. Also, when the β_1 integrin receptors were blocked, corneal fibroblasts proliferated more, underwent less apoptosis, and exhibited myofibroblast markers. Based on this data, the MK/T-1 cells used in this study were predicted to exhibit myofibroblast markers, secrete the inappropriate matrix, and have abnormal matrix metalloproteases (MMP's). Immunofluorescence and western blotting were used to investigate the presence of fibronectin, tenascin, α-smooth muscle actin, β_1 integrin, collagen VI, and NG2 receptors. Zymograms were used to indicate which MMP's were produced. Due to contamination problems with the MK/T-1 cells, no conclusive results were reached regarding the matrix components, receptors, and MMP's being produced by the cells. Cell survival on the three different supplied matrixes was consistent with the previous data, in that the cells plated on Type VI collagen underwent less apoptosis compared to those on Type I collagen or glass.